

GROUP D.8

PARACHUTE BRAKE (CODE TC)

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Equipment employed

1. The major components employed in the parachute brake circuit are quoted below, together with the appropriate Air

<i>Control switch, Rotax Type D.10007</i> } A.P.4343C, Vol.1, Book 1, Sect.1. ►
<i>Test switch, N.S.F. Type 7675/B.102</i> } A.P.4343C, Vol.1, Book 1, Sect.2.
<i>Micro switches, Type 4.A</i> A.P.4343C, Vol.1, Book 1, Sect.2.
<i>Circuit breaker, B.T.H. Type LGA.6-B1/1</i> A.P.4343B, Vol.1, Book 2, Sect.10.
<i>Door solenoid, Rotax Type D.5320</i> A.P.4343E, Vol.1, Sect.1.
<i>Jettison release unit, Vickers A.5931 modified to Vickers Drg. No.92574, Sheet 71</i> A.P.4343X, Vol.1, Sect.1.
<i>Warning lamp, Hawker design</i> A.P. Vol.1, Sect.

DESCRIPTION**Parachute brake****General**

2. The parachute brake is installed in a fairing above the tail cone of the rear fuselage with its cable attached to a shackle held in the jaws of an electro-magnetic release unit bolted to the top of frame 57. The parachute is streamed and jettisoned by the operation of a switch in the cabin and a twin filament warning lamp, controlled by a micro switch operated by the parachute doors, is provided to indicate that the parachute has been streamed. The

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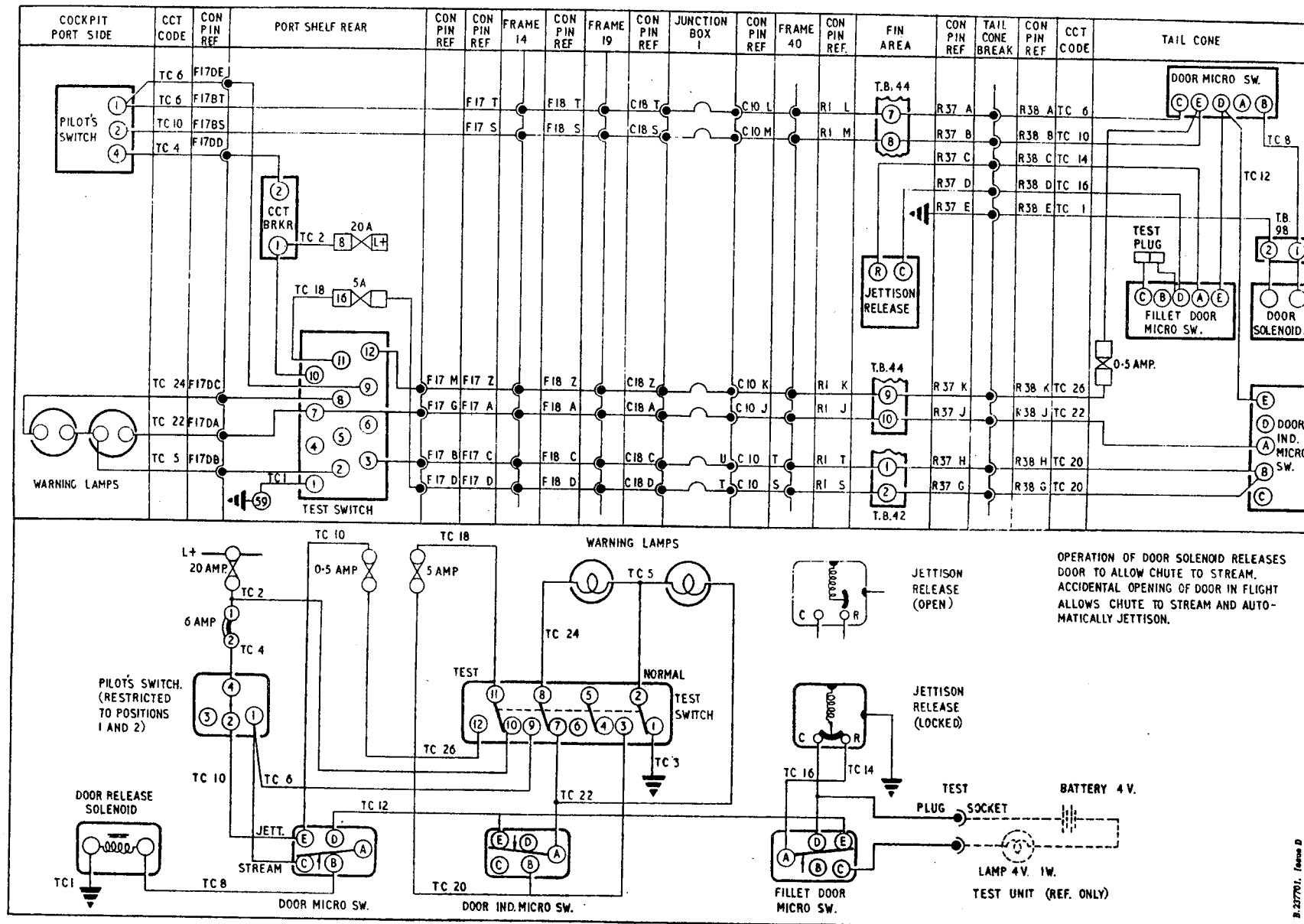


Fig. 1. Parachute brake (routeing and theoretical)

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electrical control circuit is designed so that, should the parachute doors open inadvertently in flight or during take-off, and stream the parachute without operation of the control switch, the parachute release unit will be automatically energized, via a further micro-switch, and jettison the parachute, so preventing an emergency arising due to the drag of the parachute.

3. Access to the release unit for parachute attachment is made through an access door in the tail cone fillet. When opened, this door releases a micro switch which isolates the electrical supply to the release unit so preventing any possible damage to the unit, due to an electrical overload, when inserting the parachute shackle. A small two-pole plug, located adjacent to the release unit, is provided for testing the release unit for correct cocking.

4. The continuity of the control circuit may be checked by the operation of a test switch situated in the cabin. When this switch is in the TEST position, the filaments in the warning lamp are connected in series with the parachute door release solenoid and the release units operating coil, via the micro switches and the lamp filaments will glow to indicate that the circuit is complete.

Control switch and warning lamp

5. The control switch is situated on a bracket attached to the port glare shield in the cabin and is marked JETTISON OFF and STREAM. The switch is a three position, spring-return to centre from one side

only type, but on this aircraft the spring-return side is not used, as the switch is restricted to two positions only by a guard plate. The parachute warning lamp is mounted above the control switch and consists of a Hawker designed lamp housing containing two filaments. The lamp is controlled by a door indicator micro switch, which is situated in the tail cone and operated by the parachute door when open. Both filaments of the lamp glow to indicate that the parachute is streaming and will remain lit after the parachute has been jettisoned.

Door solenoid and parachute release unit
 6. The parachute doors are spring-loaded and are opened to stream the parachute by a solenoid-operated release mechanism located in the tail cone. The solenoid is controlled by the control switch via a door micro switch. The door micro switch is operated when the doors open to isolate the supply to the door release solenoid and then complete the circuit from the control switch to the parachute release unit, via the fillet door micro switch. It is, therefore, impossible to jettison the parachute until it has been streamed.

Test switch and cocking test plug

7. The test switch is situated on the rear portion of the cabin port shelf and is marked TAIL CHUTE TEST. The switch is used in conjunction with the parachute warning lamp to check the continuity of the control circuit, door release solenoid and release unit. The rear portion of the cabin port shelf also contains the parachute circuit breaker and supply fuses. A further

0.5 amp. fuse, which protects the test circuit, is contained in a Belling Lee fuse-holder situated on the port side of the tail cone front former Access to this latter fuse may be obtained when the parachute doors are open. The cocking test plug is situated in the tail cone adjacent to the release unit, access being obtained through a door in the port side of the tail cone. The plug is used to connect a test set to the release unit circuit to check that the unit is serviceable and correctly cocked. The fillet access door must be open when using this test plug to allow the fillet micro switch to complete the test circuit to the release unit.

Operation

Normal stream and jettison

8. The theoretical diagram of the circuit (fig.1) is drawn in the condition found when the parachute is stowed with its doors closed, the control switch in the JETTISON OFF position and the automatic parachute jettison circuit ready to operate i.e., normal flight conditions. If during landing, the control switch is placed in the STREAM position, a supply will be fed to contact C of the door micro switch, which is in the un-operated condition, because the doors are closed. In this condition, contacts C and B of the micro switch are made and complete the circuit to the door solenoid.

9. When the door solenoid is energized, it allows the door locks to release the doors, which open and stream the parachute. With the doors open, contacts D and E of the door micro switch are made to

complete the circuit from the control switch to the parachute release unit via the fillet door micro switch. When the control switch is returned to the JETTISON OFF position, current is fed to contact E of the door micro switch and, as the doors are open, current passes to the parachute release unit via contacts A, D and E of the fillet door micro switch. When the release unit is energized, its jaws open and so jettison the parachute.

Indication

10. When the parachute doors open to stream the parachute, the door indicator micro switch is operated and makes contacts A, B and C. Contacts A and B of the micro switch complete a supply to both filaments of the warning lamp. This supply is obtained from the circuit fuse via contacts 10 and 11 of the test switch and also passes through a 5 amp. fuse before reaching contact B of the micro switch. One filament is supplied through contacts 7 and 8 of the test switch and the other is fed direct from contact A of the micro switch. The return from both filaments passes to earth through contacts 1 and 2 of the test switch. The warning lamp will, therefore, glow when the doors open to give an indication that the parachute is streaming. The lamp remains lit after the parachute has been jettisoned, but is extinguished when the battery master switch is placed in the OFF position after flight.

Automatic jettison

11. The operation of the automatic

safety jettisoning of the parachute on inadvertent release, is such that when the doors open and allow the parachute to stream, the door micro switch is operated and makes contacts D and E. With these contacts made, a supply is immediately available from the control switch to the parachute release unit, via the fillet door micro switch. The release unit is, therefore, energized immediately and jettisons the parachute.

Release unit overload precaution

12. When the fillet door is opened to gain access to the release unit for parachute attachment, the fillet door micro switch is released and makes contacts A, B and C, thus isolating the supply to the release unit and completing the circuit of the cocking test plug. The isolation of the supply is necessary, because, with the parachute doors open, a supply is available at the release unit via the door micro switch. Under these conditions, the release unit would be energized immediately the shackle was inserted into the jaws and if the shackle was held in the jaws manually for any length of time, the release unit's solenoid coil and feed switches would be damaged by the electrical overload.

13. After insertion of the shackle, the release unit may be tested for correct cocking by use of the cocking test plug. (para.15). When the parachute doors are closed after the parachute has been stowed, the door micro switch is released and makes contacts A, B and C to isolate the feed to the release unit. When the fillet

door is closed the fillet door micro switch is operated and makes contacts A, D and E to complete the circuit to the release unit ready for further operation.

Control circuit test

14. The door release solenoid, release unit and control circuit are tested for continuity when the test switch is placed in the TEST position. With the switch in this position, one filament of the warning lamp is connected in series with the parachute door release solenoid via the door micro switch and the other filament is connected in series with the release unit's operating coil via the door indicator and fillet door micro switches. Both filaments will, therefore, glow to indicate that the circuit is complete and undamaged.

Release unit test

15. The cocking test plug is used to connect a test set, consisting of a lamp and low voltage battery, to the release unit circuit to check that the unit is serviceable and correctly cocked. The fillet access door must be open when using this test plug to allow the fillet micro switch to complete the test circuit (para.12); the test lamp will light, when the release unit is serviceable and correctly cocked, as a circuit is then completed through the release unit feed switches, solenoid coil and test set.

SERVICING

General

16. For general servicing of the electrical system, reference should be made to Group A.1. All the components must be kept

clean and inspected periodically for signs of damage and to ensure that they are securely mounted. Apart from the standard routine bench testing of the components, as described in the appropriate Air Publications quoted in para.1, no further servicing should be required.

REMOVAL AND ASSEMBLY

General

17. Once access has been obtained, the removal and assembly of the components forming the parachute brakes circuit should present no difficulties. The location and access to all the components is indicated in Group A.3.



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